

### **ABSTRACT**

Disclosed are systems and methods involved in extreme high throughput screening of compounds which have an affinity for a biological target. The system is based on a capillary bundle with two distinguishable ends wherein capillaries on one end are connected to compounds stored in discrete reservoirs and capillaries on the other end are bound and processed to form a two dimensional microarray. A capillary bundle having reaction wells for hybridization and compound reaction in one end of the capillaries is disclosed. The capillaries may be light-conducting. Also disclosed are various methods of identifying a target compound in a liquid using this capillary bundle as well as methods of fabricating the bundle.

A novel surface tension guided reaction chamber is also provided. Methods and chemistry for fabrication and use of a surface tension guided reaction chamber in binding and hybridization assays are also disclosed. Methods and systems for precise metering of fluids within the capillaries and at the reaction chambers, including the surface tension guided "virtual" reaction well is provided. Methods for performing high throughput screens using optical fiber lined capillaries of the invention are also provided. The capillary arrays are used with both liquid probes as well as probes immobilized on the walls of the capillary.